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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,472	02/11/2004	Daniel James Branagan	NANO004U	4067
32047	7590	12/23/2004	EXAMINER	
GROSSMAN, TUCKER, PERREAULT & PFLEGER, PLLC 55 SOUTH COMMERICAL STREET MANCHESTER, NH 03101			ZHENG, LOIS L	
			ART UNIT	PAPER NUMBER

1742

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/776,472

Applicant(s)

BRANAGAN, DANIEL JAMES

Examiner

Lois Zheng

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 1-5 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-11 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

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## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-5, drawn to a product, classified in class 420, subclass 34.
  - II. Claims 6-11, drawn to a process, classified in class 148, subclass 525.
2. Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the metallic alloy can be applied to a metal surfaces using techniques other than thermal spraying, such as dipping in molten bath.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Steven J Grossman on 3 December 2004 a provisional election was made with traverse to prosecute the invention of group II, claims 6-11. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-5 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 6-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Kung US 6,302,975(Kung '975).

Kung '975 discloses a method for applying aluminum-based diffusion coating onto a steel workpiece by thermal spraying(abstract).

With respect to claim 6 of the instant invention, the coating material of Kung '975, comprising aluminum, chromium, boron and/or silicon(i.e. deoxidizing elements), is in the form of alloyed powder or another form of solid(abstract, col. 2 lines 39-42, col. 3 line 67-col. 4 line 5). After being fed into thermal spray gun, the coating alloy material melts(col. 3 lines 43-44). The molten feed material is then sprayed onto the metal workpiece to form a coating layer(col. 3 lines 58 – 61).

With respect to claim 7 of the instant invention, Kung '975 further discloses that the diffusion coating does not necessitate the use of a slurry(abstract), which reads on the claimed liquid coating material having no precipitates as recited in instant claim 7.

With respect to claim 8 of the instant invention, the use of chromium and boron and/or silicon(abstract) in the coating material of Kung '975 would read on the claimed de-oxidizing element as recited in instant claim 8.

With respect to claim 9 and 10 of the instant invention, Kung '975 teaches that the metal coating material can be applied to a steel workpiece by thermal spraying means such as wire arc spraying or plasma spraying(col. 3 lines 35-39).

Therefore, Kung '975 anticipates the claimed invention.

7. Claims 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Branagan et al. US 6,258,185(Branagan '185).

Branagan '185 discloses a method of forming a steeling(abstract).

With respect to claim 6 of the instant invention, Branagan '185 teaches, in one of the embodiments, that metallic molten alloy of  $\text{Fe}_{68}\text{Cr}_4\text{Mo}_7\text{P}_{12}\text{B}_6\text{C}_3$  is sprayed onto a metallic substrate to form a coating layer(col. 7 lines 15-18). Cr, B and C of the molten alloy in Branagan '185 reads on the claimed deoxidizing elements as recited in instant claim 6.

With respect to claim 7 of the instant invention, Branagan '185 does not teach the presence of precipitates in the molten coating alloy.

With respect to claim 8 of the instant invention, Branagan '185's metallic coating alloy comprises chromium, boron and carbon, which reads on the claimed deoxidizing elements as recited in instant claim 8.

Therefore, Branagan '185 anticipates the claimed invention.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kung '975.

The teachings of Kung '975 are discussed in paragraph 6 above.

Kung '975 does not specifically teach that the metal substrate has an oxidized surface layer, and the oxidized surface layer is reduced by the deoxidizing element in the metal melt, and a metallurgical bond is formed as recited in instant claim 11 steps (c)-(e).

However, it would have been obvious to one of ordinary skill in the art to have found the presence of an oxidized surface layer on the metal substrate obvious since an oxidized layer on a metal substrate surface can be formed naturally over time by native oxidation. Furthermore, Kung '975's metal coating material comprises claimed deoxidizing elements such as chromium, boron and/or silicon. Therefore, one of ordinary skill in the art would have found that the claimed reduction of oxidized surface layer and the metallurgical bonding would inherently occur in Kung '975's process since Kung '975 discloses the substantially similar metal coating process as claimed.

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Branagan '185.

The teachings of Branagan '185 are discussed in paragraph 7 above.

Branagan '185 does not specifically teach that the metal substrate has an oxidized layer, and the oxidized surface layer is reduced by the deoxidizing element in

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the metal melt, and a metallurgical bond is formed as recited in instant claim 11 steps (c)-(e).

However, it would have been obvious to one of ordinary skill in the art to have found the presence of an oxidized surface layer on the metal substrate obvious since an oxidized layer on a metal substrate surface can be formed naturally over time by native oxidation. Furthermore, Branagan '185's metal coating material comprises claimed deoxidizing elements such as chromium, boron and carbon. Therefore, one of ordinary skill in the art would have found that the claimed reduction of oxidized surface layer and the metallurgical bonding would inherently occur since Branagan '185 discloses the substantially similar metal coating process as claimed.

11. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Branagan '185 in view of Kung '975.

The teachings of Branagan '185 are discussed in paragraph 7 above.

However, Branagan '185 does not explicitly teach the use of claimed thermal spray means such as wire arc spraying or plasma spraying as recited in instant claims 9-10.

Kung '975 teaches that a metal coating material can be applied using any available commercial thermal spray process, such as wire arc spraying or plasma spraying(col. 3 lines 35-39).

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized wire arc spraying or plasma spraying of Kung '975 in the metal coating process

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of Branagan '185 since the use of well known commercial wire arc spraying or plasma spraying techniques as taught by Kung '975 would lead to the expected success.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LLZ  
12/21/2004

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